

The opinion in support of the decision being entered today was **not** written for publication in a law journal and is **not** binding precedent of the Board.

Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte TAKEO KANAI

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Appeal No. 1997-2340  
Application No. 08/329,687

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HEARD: September 14, 2000

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Before FLEMING, LALL, and BARRY, Administrative Patent Judges.  
BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the rejection of claims 1-9. We reverse.

BACKGROUND

The invention at issue in this appeal relates to over-voltage protection. Asynchronous inputs and short circuits generate over-voltage in the windings of generators and motors. Over-voltage protection devices use parallel current

paths including VBO free thyristors to protect against the over-voltage. The thyristors are switched on, i.e., fired, by a gate or fire by themselves, i.e., self-fire, to relieve over-voltage.

Randomness between the self-firing voltages of the individual thyristors and temperature variations can cause current flow to become concentrated in one of the parallel circuits. To prevent such a condition, heretofore, temperature control and VBO free thyristors having identical characteristics had to be used in over-voltage protection devices. Consequently, such devices were bulky and costly.

In contrast, a sensor in the inventive protection device detects the self-firing of a thyristor in any one of its parallel current paths. Upon such detection, a gate fires all the other thyristors. Firing all the thyristors allows current to flow through all the current paths thereby distributing the excessive current between the various paths.

The distribution relieves the over-voltage before any components are damaged.

Claim 6, which is representative for our purposes, follows:

6. A switching circuit protection method comprising the steps of:  
detecting the self-firing of at least one switching element due to an over-voltage in a switching circuit having multiple parallel circuits;  
applying a firing pulse to all the switching elements in the switching circuit in response to the detected self-firing; and  
firing all un-fired switching elements at the same time due to the firing pulse.

Besides the appellant's admitted prior art (AAPA), the references relied on in rejecting the claims follow:

Mitsuoka	4,697,219	Sep. 29, 1987
Takahashi	4,796,146	Jan.
3, 1989.		

Claims 1-9 stand rejected under 35 U.S.C. § 103 as obvious over AAPA in view of Takahashi and Mitsuoka. Rather than repeat the arguments of the appellant or examiner in toto, we

refer the reader to the briefs and answer for the respective details thereof.

#### OPINION

In deciding this appeal, we considered the subject matter on appeal and the rejection advanced by the examiner. Furthermore, we duly considered the arguments and evidence of the appellant and examiner. After considering the totality of the record, we are persuaded that the examiner erred in rejecting claims 1-9. Accordingly, we reverse.

We begin by noting the following principles from In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993).

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).... "A prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." In re Bell, 991 F.2d 781, 782, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting In re Rinehart, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)). If the examiner fails to establish a prima facie case, the rejection is improper and will be

overturned. In re Fine, 837 F.2d 1071, 1074, 5  
USPQ2d 1596, 1598 (Fed. Cir. 1988).

With these principles in mind, we address the examiner's  
rejection and the appellant's argument.

The examiner's rejection follows in pertinent part.

The prior art figure does not show a detect means  
for detecting the voltage or current of the  
switching thyristors in order to send a firing pulse  
to all of the switching elements to protect the  
thyristor(s) which is(are) conductive.

Takahashi shows in figure 1 series connected  
thyristors 1N, 12, 13 with a voltage detect circuit  
in parallel to each thyristor (4N ... 4I) and a  
digital circuit for combining and comparing the  
voltage sense responses for determining an out of  
range voltage for any of the individual thyristors  
and sending a signal h to simultaneously fire all of  
the thyristors into conduction to avoid an  
application of overvoltages across some of the  
thyristors.

Mitsuoka shows in figure 5 a current sensor 13  
for measuring the current through the thyristor 1  
and parallel components for detecting an abnormal  
signal, causing the conduction of the thyristor 11a  
and 11b to protect the thyristor 1.

(Paper No. 16 at 3.) The appellant argues, "the prior art  
does not disclose or suggest the claimed detecting of self-  
firing." (Appeal Br. at 7.)

``[T]he main purpose of the examination, to which every application is subjected, is to try to make sure that what each claim defines is patentable. [T]he name of the game is the claim ....'" In re Hiniker Co., 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998) (quoting Giles S. Rich, The Extent of the Protection and Interpretation of Claims--American Perspectives, 21 Int'l Rev. Indus. Prop. & Copyright L. 497, 499, 501 (1990)). Furthermore, "[c]laims are not interpreted in a vacuum, but are part of and are read in light of the specification." Slimfold Mfg. Co. v. Kinhead Indus., Inc., 810 F.2d 1113, 1116, 1 USPQ2d 1563, 1566 (Fed. Cir. 1987) (citing Hybritech Inc. v. Monoclonal Anti-bodies, Inc., 802 F.2d 1367, 1385, 231 USPQ 81, 94-95 (Fed. Cir. 1986); In re Mattison, 509 F.2d 563, 565, 184 USPQ 484, 486 (CCPA 1975)). Here, claim 1-5 specify in pertinent part the following limitations: "detect means for detecting the self-firing of any of the switching elements in the switching circuit due to the over-voltage ...." Similarly, claim 6 specifies in pertinent part the following limitations: "detecting the self-firing of at least one switching element due to an over-voltage in a switching

circuit having multiple parallel circuits ...." Also similarly, claims 7-9 specify in pertinent part the following limitations: "a detection circuit which detects a self-firing of either the switching element of said first current path or the switching element of said second current path ...."

The specification defines self-firing as follows.  
"[E]ven when there is no ON command, VBO free thyristors 11, 12, 21, 22, 31, and 32 can fire by themselves and prevent over-voltage." (Spec. at 2.) Reading the limitations in light of the specification, claims 1-9 require detecting the self-turning-on of a switching element absent an ON command.

The examiner fails to show a suggestion of the limitations in the prior art. "Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." Para-Ordnance Mfg. v. SGS Importers Int'l, 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995)(citing W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1551, 1553, 220 USPQ 303, 311, 312-13 (Fed. Cir. 1983)). "The mere fact that the prior art may be

modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification."

In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992) (citing In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)). "It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." Id. at 1266, 23 USPQ2d at 1784, (citing In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991)).

Here, the examiner admits that AAPA does not teach detecting the self-turning-on of a switching element absent an ON command. He specifically admits, "[t]he prior art figure does not show a detect means for detecting the voltage or current of the switching thyristors in order to send a firing pulse to all of the switching elements to protect the thyristor(s) which is(are) conductive." (Paper No. 16 at 3.) The examiner fails to show that Takahashi and Mitsuoka remedy the defect of AAPA.



Although Takahashi teaches detecting, it does not detect the self-turning-on of a switching element absent an ON command. To the contrary, "a partial turn-off phenomenon itself is detected ...." Col. 7, ll. 11-12. The reference describes the phenomenon as follows.

In more detail, when many thyristors are turned off, reverse voltages are required to be applied across the corresponding thyristors during long enough intervals that all of the thyristors can withstand forward voltages subsequently applied thereto. In case these reverse voltage intervals are insufficient, when a forward voltage is applied across the thyristors, some thyristors can withstand the forward voltage, but the remaining thyristors fail to perform forward recovery, i.e., recover their features to withstand the forward voltage, with the result that they maintain their conductive states. This phenomenon is a so-called partial turn-off phenomenon.

Col. 1, ll. 28-40. In summary, Takahashi detects partial turn-off of some thyristors rather than their self-turning-on.

For its part, although Mitsuoka teaches detecting, it does not detect the self-turning-on of a switching element absent an ON command. To the contrary, "the main current path of the GTO 1 is provided with a current detector 13 for

detecting the value of the main current of the GTO **1**. The output of this current detector **13** is applied to a control circuit **14**. This control circuit **14** is a circuit which serves to selectively activate the sub snubber circuits **2a** and **2b** in accordance with the magnitude of the main current value of the GTO **1**." Col. 3, ll. 14-20. In summary, the reference detects the magnitude of the main current of a thyristor rather than its self-turning-on.

Because Takahashi detects partial turn-off of some thyristors and Mitsuoka detects the magnitude of the main current of a thyristor, we are not persuaded that teachings from the prior art would have suggested the limitations of "detect means for detecting the self-firing of any of the switching elements in the switching circuit due to the over-voltage;" "detecting the self-firing of at least one switching element due to an over-voltage in a switching circuit having multiple parallel circuits;" or "a detection circuit which detects a self-firing of either the switching element of said first current path or the switching element of said second

current path ...." The examiner fails to establish a prima facie case of obviousness. Therefore, we reverse the rejections of claims 1-9 as obvious over AAPA in view of Takahashi and Mitsuoka.

CONCLUSION

In summary, the rejection of claims 1-9 under 35 U.S.C. § 103 as obvious over AAPA in view of Takahashi and Mitsuoka is reversed.

REVERSED

MICHAEL R. FLEMING	)	
Administrative Patent Judge	)	
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	)	BOARD OF PATENT
PARSHOTAM S. LALL	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
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LANCE LEONARD BARRY	)	
Administrative Patent Judge	)	

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